

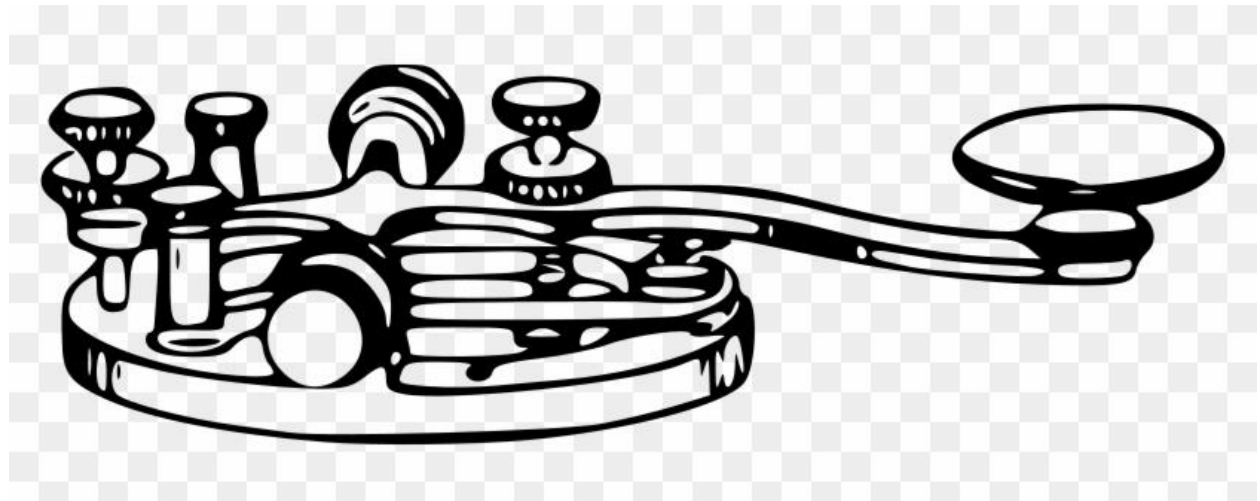


QSA-5

Marin Amateur Radio Society Monthly Newsletter

Established 1933

February 2023



When all else fails, you can count on Amateur Radio

From Our President:

It is energizing to see Marin turning green again. After our nice rainfall and our recent sunny, but cool days, the grass is growing, and the trees look happier. MARS has brought back life to the Education Committee after a few years of being dormant. Curtis Ardourel, WA6UDS has been appointed Chairman of the committee. If you would like to be part of the committee and/or would like to be part of the Technician class instruction, please contact Curtis. Please pass along to Curtis or the Board any suggestions for other education projects. Example could be CW, MESH, Digital modes, DMR, and? There is a lot of experience and knowledge within our club members that could be shared to help the hobby to grow.

MARS will continue to help grow the MESH network within Marin. We will also offer assistance to other clubs or individuals. Training will be a big part of MARS NBAM going forward. The Board is looking for individuals to join the NBAM committee. If you are interested, please contact Jeff Young KM6Y, Rob Rowlands NZ6J, or me.

The next General meeting will be Feb 3 at 7:30 pm. Once again it will be a Hybrid version. If you wish to attend in person, please leave a message at RSVP@w6sg.net.

73,

Ken Brownfield, AB6JR

From the Editor:

We made it through the first month of the new year! As you'll notice in the board meeting notes, the Marin Amateur Radio Society is building back up it's educational and training programs. This is a great thing and has inspired the QSA-5 to start adding articles for new amateur radio operators that will aid in the development of their radio skills. Education is an important part of any radio club because the only way to keep ham radio alive is to bring new, younger members into the fold.

With an interest in DMR, the QSA-5 will continue to write and publish articles on DMR basics. We're also going to keep writing about QRP radios since this seems to be of interest to many younger hams I've spoken with. Personally, I got into QRP radios because I like the portability (not to mention I just can't afford a full sized rig). I'm a teacher by trade and during the pandemic, went back to school to study electronics. After receiving my certification in IOT design and prototyping (discovering that I'm too old to do that again), I started building SDR radios and Arduino Antenna tuners, meeting a lot of younger hams that loved this area of radio. Younger hams also love DMR radio and they introduced me to that world. DMR came with a steep learning curve for me but, thanks to classmates, I can now build and program WiFi hotspots and write codeplugs without wanting to scream in frustration. Bottom line: I want to include these topics within the pages of the QSA-5 to stay relevant with the times.

As always, thanks to those of you who sent me ideas and material to be included in the pages of the QSA-5. The more you contribute, the more interesting our publication becomes. Have a great shortest month of the year.

QSA-5Editor@w6sg.net



New Members:

Erick Steinberg K6ER - Mill Valley

John Woodworth KM6AHT - San Rafael

Basim Humeid KN6YFW - San Rafael



“Your parents hath given you a name. And the FCC hath given you another...”



**Marin Amateur Radio
Society
Board of Directors Meeting**

12 January 2023

Call to Order 19:30 Hours (7:30 PM)

Attendance:

President: Ken Brownfield AB6JR

Director: Richard Cochran AG6QR

Vice President: Tom Jordan KG6TCM

Director: Steve Toquinto KB6HOH

Secretary: James Saltzgaber KM6WWY

Director: Jeffrey Young KM6Y
Treasurer: Bruce Bartel N6VLB
Trustee: W6SG Marc Bruvry KF6VNT
Trustee: K6GWE Brian Cooley KB6EZX

Adopt Agenda:

Approve minutes: of 8 December meeting. **MSC**

Secretary's Report/Communications: Jim KM6WWY- Insurance rates are going up. Business Auto is increasing about \$270 and Commercial Package is increasing \$841. Insurance agent has given us forms to shop for lower premiums. Need someone who can fill them out. Renewal is due 3/3/23. Google Drive is being rearranged and will send out folder structure when changes are completed. Jeff KM6Y offered assistance if needed. Bruce N6VLB inquired if he had full Google drive privileges - all board members do through Mars board group.

Treasurer's Report: Bruce N6VLB- Monthly financial report is in QSA-5, Bruce requested that the board clarify permissions or authority to write checks. He suggested that we may need a finance committee to approve bills for payment so that we would not need full board approval to pay expenses. Milt KM6ASI noted that recurring expenses and board previously approved expenses would be no problem for the treasurer to pay. A discussion on establishing an annual budget and budgets for each of the club's committees followed. Mark KM6AOW noted that we are using Quick-Books, and that Quick-Books can move paid expenses into a projected budget. Bruce N6VLB to produce a pro-forma budget and circulate to the committees to add their budget items and then bring it back to the board for approval. No further discussion.

Committee and other Reports:

1. **Membership:** Curtis WA6UDS- 44 current members, 28% of last year. We need to recover credentials for the domain name registrar for W6SG.com/.net/.org. Curtis to work with Ken AB6JR and Jim WA6WWY. After receiving the Public Service participation list, he will send out membership

renewal notices. And he will get the Public Service Honor Roll up on our website.

2. **Facilities:** Skip KJ6ARL- Drain along the west side of the building working ok. Dirt embankments at outflow of pipe are subject to washing down and blocking effluent grate at southwest end in hard rains, needs some blocks or Ready-Mix bags installed. Seems to be not flooding our neighbor's property. Wifi - Rob NZ6J inquired if Wifi was being billed to Doug KF6AKU(SK), Curtis WA6UDS No, it's billed to the club. Rob and Curtis have credentials for the ATT account.
3. **Public Service:** Pam N6PDW & Stan AI6NF, & Rob NZ6J- February 25th picnic at Richmond Rod and Gun, Ann K6SHO to arrange. Curtis WA6UDS to set up the caterer. Need to get the public service budget together & approve at the next board meeting. 3 TBD's in 2023 schedule, most dates are 1 day from last year's. **Approval of 2023 Public Service Calendar 13 events, no major change from last year = MSC.** Budget to be submitted to the board at the Feb. meeting. Discussion as to who is actually invited to the public service picnic. All club members would be invited. **\$700 to set up RRG for picnic= MSC.**
4. **Technical:** Milt KM6ASI- Dan K6NQZ has ordered replacement simulcast middle peak antenna. Negotiations ongoing with the county for installation date. Antenna installation should be completed by the end of the month.
5. **VOAD/RCV:** Skip KJ6ARL- Both going well, Skip & Rob K6RGI are working on training and exercises for both RCV & RACES given the transitional status of county office of emergency management structure. At least 2 Joint exercises, Great Shakeout, in October, and Golden Eagle, date TBD. Working out blending of RCV & RACES organizations, given that County Fire is now in charge of EOC. Sharing training info with Minnesota state Level VOAD AND ARES leadership. Agreed that resources will be shared, informally at present. Looking for new recruits and training exercise ideas. Possible VOAD mutual support in east or north bay to work with in the future.

6. VE Testing: Ken AB6JR- Exam Saturday 1/14, 7 applicants 2 from Marin County, 2 from SF.
7. NBAM - Jeff KM6Y- Looking forward to the future and also putting together packages that can be used for emergency, event, training purposes. Will be doing training at Club house. Still installing stations even with weather. Rob NZ6J - Wolfback Ridge recovered - mouse damage and power supply bad. Milt KM6ASI - County W6ECU will not be putting UHF repeater equipment on Muir Beach tank.

Old Business:

1. Field Day – REDXA Curtis WA6UDS has figures and is awaiting response.
Treasurer be authorized to write up to NTE \$130.00 to settle REDXA field day 2022 account. = MSC

New Business:

1. **Education committee restart:** Ken AB6JR: Time to set up a new education committee. Curtis WA6UDS - bylaws state part of the club's mission is to conduct education, and we have not done so in some time. He has a great interest in the club training committee. He will have some time as he is retiring to work on education. Follow MDARC ARRL modules, education not ham-cram. Rob NZ6J - to include not just license training, TCPIP, DMR, & mesh. Ken agreed. Curtis - education should be inclusive of not just ham licensing. Skip KJ6ARL -could add 1 hr. training at Club Meetings. Larry Bradly KK6QPE - MDARC is running an 8-week Technician class. Will make MDARC's google drive training assets available to Curtis. Jeff KKM6Y - wants to increase the stature of MARS as a club. Education, training and getting new hams and doing it beyond just the scope of the club, outreach not just with club members, but out into the county. Rich AG6QR - Need to use the clubhouse and radio shack to promote ham radio. Should at least do what we had in the past. Ken - Restart Education committee. **Since he is volunteering for the job, Ken appointed Curtis to be the Education Committee Chairman.** Curtis to reach out to the full membership for

suggestions. Rob - presentation of club's repeater system is needed. Curtis will send out an announcement email of the Education Committee restart and solicit committee members.

2. **Insurance for Trustee's:** Milt KM6ASI- Trustees are "limited board members" and are covered by errors and omissions insurance. No further action required at this time.
3. **Zoom Club account:** Ken AB6JR would like the club to get its own zoom account. Jeff KM6Y - make account available to committees of the club.
MSC that MARS will get its own Zoom Account. Bruce N6VLB - need to get mail chimp account payment transferred from Curtis WA6UDS to the club. Curtis and Bruce to accomplish transfer.
4. **NBAM going forward:** Jeff KM6Y - Ideas from meeting to discuss where NBAM might go in the future. General consensus is that the club should be involved in NBAM growth. Having Mesh for all things ham is an asset and gives the opportunity to work with schools. Club should sponsor some outreach and does the club want to sponsor this program going forward. Ken AB6JR - what would be cost to club to go forward? What would the emphasis be? Jeff - Feb 1 deadline for grant from ARDC. Tom KG6TCM - Propose that for a 1 year period MARS take over NBAM Rob NZ6J - not interested in being the leader for the committee. Ken was concerned about monetary commitment by club. Tom - this has tremendous capability for emergency communications. Rob - potential to serve EOC lost with change of EOC management. Tom - We can find ways to make that happen. Skip KJ6ARL - would like to see mesh continue for resource allocation between organizations. Mesh will keep ham operators in the field. Mesh is a very viable option and may be better than existing digital modes. Ken-Novato Fire Admin has mesh, working with Novato PD. Would other Fire and PD be interested? Would Sonoma continue to be in our NBAM focus? Doesn't think we should fund Sonoma without a club in sonoma. Jeff - Equipment costs can be borne by users. Need to get the community involved and interested. Mesh is not that expensive. Skip - couldn't someone not on the board do this. Jeff yes, but needs leadership from the board to get the Feb. 1 grant proposal done. Ken - he will stay at committee level but not head committee. Jeff- need board member to take it for 3 months. Curtis - committee needs only one board member. Need to build a committee. Ken - needs **Motion for Mars to continue to operate existing NBAM committee**

as presently constituted. MSC Jeff - requests board permission to contact ARDC with grant submission requirements. Ken - Jeff Young to act as agent of MARS NBAM committee to engage ARDC to negotiate grant particulars. If no grant is received, NBAM work will be reduced accordingly.

Good of the Order Tom KG6TCM - Thanks to Ken AB6JR for taking President position.

Executive Session: None

Adjourn MSC to adjourn 2118 Hours (9:18 OM)

Next Regular Meeting 3 February 2023

Next Board Meeting 9 February 2023

**Marin Amateur Radio Club
Balance Sheet Comparison
As of January 30, 2023**

AS OF JAN 30, 2023,

AS OF JAN 30, 2022 (PY)

ASSETS

Current Assets

Bank Accounts

B of A Building account - 8795	5,899.44	1,917.21
B of A General account - 4328	12,812.57	17,408.79
CD	25,000.00	25,000.00
Money Market	5,000.00	5,000.00
Ve Session Cash Received	-87.00	

Total Bank Accounts	\$48,625.01	\$49,326.00
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Other Current Assets

Uncategorized Asset	-95.00	
Total Other Current Assets	\$ -95.00	\$0.00

Total Current Assets	\$48,530.01	\$49,326.00
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Fixed Assets

Clubhouse - 27 Shell Rd. MV	58,983.00	58,983.00
Total Fixed Assets	\$58,983.00	\$58,983.00

TOTAL ASSETS	\$107,513.01	\$108,309.00
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LIABILITIES AND EQUITY

Liabilities

Total Liabilities

Equity

Opening Balance Net Assets	124,400.00	124,400.00
Retained Earnings	-20,412.57	-16,461.90
Net Income	3,525.58	370.90
Total Equity	\$107,513.01	\$108,309.00
TOTAL LIABILITIES AND EQUITY	\$107,513.01	\$108,309.00

**Marin Amateur Radio Club
Profit and Loss
January 1-30, 2023**

	TOTAL	
	JAN 1-30, 2023	JAN 1-30, 2022 (PY YTD)
Income		
Donations	1,500.00	
Dues	65.00	
Rent	2,600.00	2,500.00
Total Income	\$4,165.00	\$2,500.00
GROSS PROFIT	\$4,165.00	\$2,500.00
 Expenses		
Accounting	55.00	
Field day	122.97	
Garbage	47.84	47.84
Other Business Expenses	104.93	
Reimbursable Expenses		1,822.88
Utilities	308.68	258.38
VE Session		0.00
Total Expenses	\$639.42	\$2,129.10
NET OPERATING INCOME	\$3,525.58	\$370.90
NET INCOME	\$3,525.58	\$370.90

LIFE IS SIMPLE



Marin Amateur Radio Society News

Due to the storms that plagued Northern California, there were few events to report on. However, after the few reports regarding upcoming club activities, there will be a few short introductory articles on subject matter that will be a regular monthly offering.

VE News

As mentioned in last month's QSA-5, Ken Brownfield AB6JR, has announced the 2023 examination schedule: The dates are Jan-14, April-8, July-8, and October-14 (2023). The examines start at 1:00 but attendees should arrive early and follow

the guidelines regarding what you need to have with you when you sit for a license exam.

The first of the club's sessions was held on January 14th and here are the results from Ken:

Hello All,

Another great exam session is behind us. Thank you all.

We had 8 people signed up. We had one person cancel but gave a great donation on the Website. We had 6 people sit for exams. 2 people passed their Tech exams, 2 people upgraded to General class and 2 people upgraded to Extra class. Participants were from Seaside, Castro Valley, San Francisco, Novato, San Rafael, and Sunnyvale.

Our next scheduled exam session is April 8, 2023.

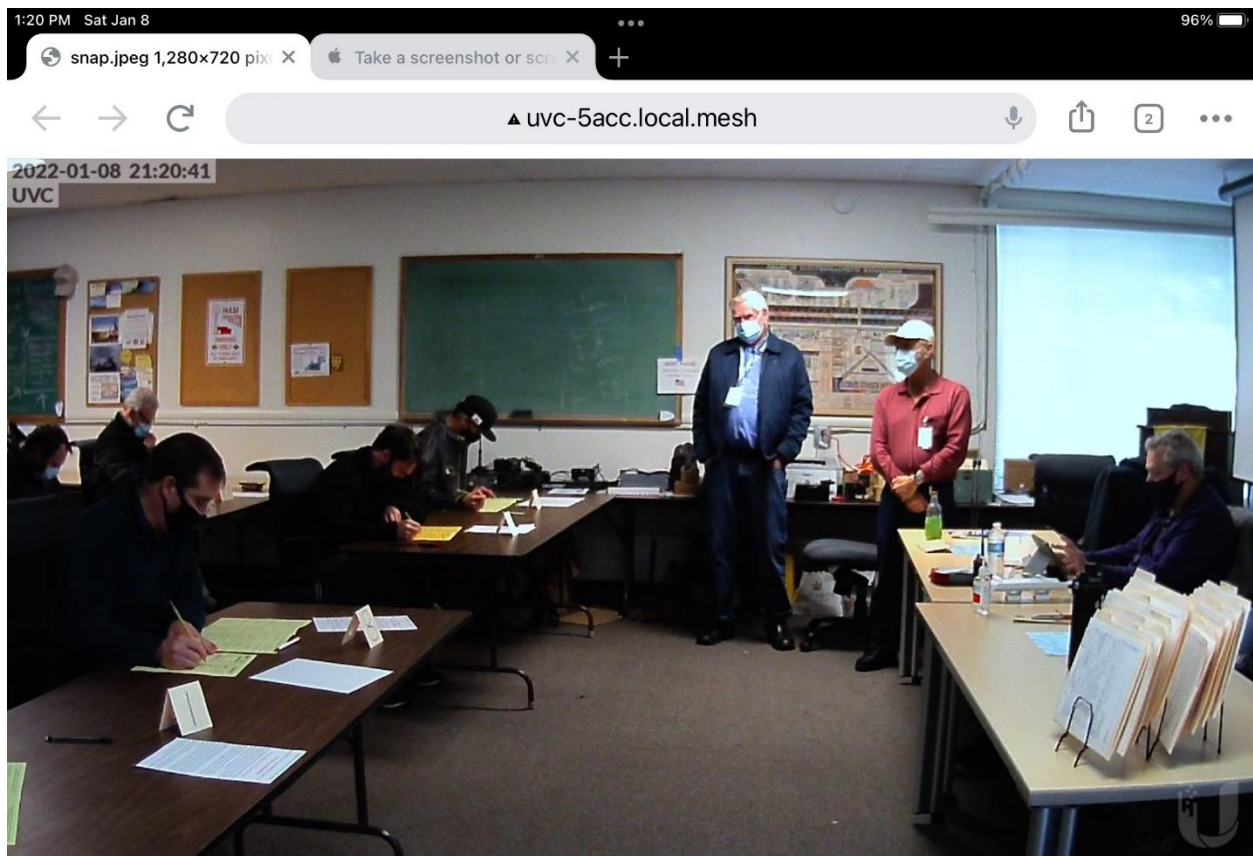
Why is the VE program so important?

To keep our passion alive, we need younger generations of people to join the ranks of amateur radio operators. Any interest can only be kept alive by bringing in new blood, younger members willing to keep that interest going into the future. Amateur radio clubs around the country partake in the Volunteer Examiner's program, providing examinations for those new to ham radio or those upgrading their existing license. The VE program keeps amateur radio alive by giving license examinations and then sending the paperwork of successful examinees to the FCC where a Callsign is issued.

To become a Volunteer Examiner, you must read the VE manual and take a test. That's exactly what I did. My reasons for doing so were simple: I took all three license tests during the Covid-19 Pandemic. There were no physical testing sites available, so I had to sit for my exams online. The Lake Washington Radio Club did online testing, so I signed up. Online testing, due to the stringent testing requirements of the FCC was daunting at best for the Washington based radio

club. However, they did it. I had several issues with my computer while testing and the club patiently worked with me to ensure I made it through the exam. This inspired me to say “thank you” by becoming a VE. Of course, radio clubs are now opened to in-person testing and the Marin Amateur Radio Society is one of those clubs that offers testing opportunities to both new hams and hams upgrading their licenses. With that said, please consider joining the VE program. You can find further information at the ARRL website:

<https://www.arrl.org/volunteer-examiners>



The Marin Amateur Radio Society did four testing sessions during 2022 (one was a last-minute testing opportunity brought about due to the change in the question pool). Once again, Ken and his team did a great job.

Critical Mass

As a result of the record breaking storms during the first three weeks of the new year, January's Critical Mass event, normally held in person at the San Rafael Civic Center (Jury parking lot), was held via Zoom instead. We'll provide coverage of the February Critical Mass event in next month's issue. However, here is the agenda for the Zoom meeting:

1. We will open, as usual, with self-introductions and **phonetic alphabet** practice. Please identify your callsign and name phonetically, and then spell phonetically your father's first name.
2. Brian Cooley K6EZX and Skip Fedanzo KJ6ARL have prepared a set of training slides for **operations at a net control station**—they will lead us through that training, to be followed by Q&A
3. Impromptu "**Storm Watch**" nets were set up during the first and second wave of Atmospheric River storms. They were in San Francisco, Southern Marin and North Marin. We'll ask Corey Siegel KJ6LDJ, Jerry Foster WA6BXV and myself to describe how they were set up, what radio protocol was employed, and how useful they proved to be.
4. This past Monday, the Marin County **Emergency Operations Center** was activated to deal with the storms' damage and aftermath. RACES/ACS operators were also activated to support the EOC. Attached are the Communications Plan, the Activation checklist, the master file of frequencies programmed into the RACES radios, and some of the out-of-county EOC contacts. We will ask Rob Ireson K6RGI and/or Milt Hyams KM6ASI to describe how those operations went, followed by Q&A.
5. The Marin Amateur Radio Society's **public service season** is about to begin, with a baker's dozen events lined up. Stan Witherspoon AI6NF, Pam Witherspoon N6PDW will briefly describe each of the events and tell us how to sign up.
6. The use of **DMR (Digital Mobile Radio)** radios in our public service events is being explored, and a number of us are "beta-testing" their applicability in inter- and intra-county comms. (Yes, it uses VHF & UHF frequencies...) Rob Rowlands NZ6J will give us a "teaser" of the future Critical Mass session

where we will dive deeper into the mysteries of DMR. Indeed, the San Francisco Radio Club plans to employ DMR in their support of the San Francisco Half-Marathon on February 5th.

For the first time, we are inviting members of the **San Francisco Two-Meter Critical Mass** to join us on this Zoom gathering. Peter McElmury AA6SF (SK) was a dear friend—he helped us to set up the North Bay 2-Meter Critical Mass; we are standing on his (and his successors') shoulders and are grateful. We hope to see you in this Zoom session.

As you see, this is an ambitious agenda—I will be watching the clock and moving us through each topic. Hope to see you this coming Sunday morning at 10am!

Michael K6MLF

It should be noted that during the worst of the storms, a check-in Net was set up for Marin County radio operators. Participants were able to check-in and give live updates of weather-related conditions.

How Critical Mass Started

The QSA-5 often reports on critical mass events in the Bay Area. While the QSA-5 has provided the “what is” regarding critical mass, we had not given you the “how” of the story, as in how critical mass started. Thanks to Michael Fischer, who forwarded this piece, you can now learn about the founding of this crucial service. A typical day's schedule and what you need to bring with you is presented at the end of this article.

First written by AA6SF – SK – April 24, 2012)

Way back in early 2010, I was sitting at home looking at my HT radio that hadn't needed charging in some time. Since I got my license in January 2009 (Technician & call sign KI6NYQ), I had taken all the HCT (Ham Communication Team) classes offered by SF NERT and many emcomm classes offered by Santa Clara County ARES/RACES, even participated in their drills, volunteered as a radio operator for Bay to Breakers, SF Marathon, SF Nike Marathon, joined SF ACS; but I still did not

feel like I knew that much about my radio and emergency communications and needed more radio practice opportunities.

I came to the realization that here in San Francisco there were few opportunities to learn more about my radio, simple UHF/VHF radio communications and few opportunities to practice using my dual band HT.

I decided to start a radio practice group. I thought I would gather together other ham radio operators to learn and practice with them and help them to learn and practice— about simple UHF/VHF radio communications. For weeks I scouted many venues in San Francisco and chose Spreckels Lake in Golden Gate Park. I announced the radio practice at the end of weekly ham nets, handed out announcements at an ACS meeting and an SFARC meeting.

Two of my best friends, Jan WB6SPX and Jim KI6RYE, said they would help and we three met over a nice bottle of red wine at Jim's house to work out (loosely) the details of the first practice. (Better than a garage in Los Altos.) I told them I had a name for the radio practice: "The 2 Meter Critical Mass Amateur Radio Practice". **On July 10, 2010, the first 2 Meter Critical Mass Amateur Radio Practice took place from 1000 hours to 1200 hours at Spreckels Lake in Golden Gate Park.** Twenty (20) hams were in attendance. Imagine that!

We talked on our radios. Some had trouble with Tone, Tone Frequency, offsets, phonetics, low battery power. There were lots of questions and the Elmers answered them.

I learned a lot that day. Exactly what I had wanted. Since then, when we meet, we continue to talk on our radios, solve problems and learn new things about our radios. I have learned something every time we met. Only once a month. Only two hours from 1000 to 1200 hours on a Saturday. Where else can you go in the city to learn about ham radio and help others learn? If you know of another place for radio practice, please tell me.

Thank you Peter McElmury AA6SF-SK for developing this for our community. We look forward to carrying on your tradition.



Here's a breakdown of the San Francisco Critical Mass monthly event, to give you a feel of how these events work:

Here's what you need to know:

Let's practice 2 Meter radio communications. We look forward to seeing you this coming Saturday

We want everyone to stay safe.

Please stay home if you aren't feeling well, have flu-like symptoms, or have had a positive Covid test result in the last 14 days.

Bring your freshly charged 2M radio, your user manual, a clipboard (and pens or pencils), and a filled water bottle.

- **What:** 2 Meter Critical Mass Radio Practice
- **Where:** Northwest Corner of Spreckels Lake (Near Fulton and Spreckels Lake Drive)
- **When:** 10:00 AM to 12:00 AM Saturday, November 12th

Please program your radios in advance; here are the frequencies we'll use.

1. Channel Alpha 146.475 PL 100
2. Channel Bravo 147.585 PL 100
3. Channel Charlie 146.445 PL 100

You are all set if you have the NERT Band Plan on your radio.

Educational Program and Training

The Marin Amateur Radio Society is gearing up to provide training classes for new hams wanting to earn their Technician's license. While this program is being developed and put together as of now, the QSA-5 will keep readers posted on the program's development and implementation. Stayed tuned!

San Francisco Kaiser half marathon, February 5, 2023

From Rob Rowlands **NZ6J**:

If you're curious about how DMR might be used on A public service event join me and others volunteering:

<https://www.sfarc.org/2023-kaiser-half-marathon.html>

If you don't have a DMR radio, we may be able to lend you one. If you do, the codeplug is super simple: sutro tower W6PW, 444.225MHz +ve 5MHz, cc1, ts1 NorCal or ts2 W6PW. One repeater covers the whole course!

Wwe will be talking about DMR this coming Sunday critical mass zoom. See workshop notes from the January meeting: https://docs.google.com/document/d/10xZ_p6pgCxuSwJYRP5pJ6ZErauOroCU_BxNdHiC6cDE/edit

(note, the QSA-5 had trouble linking the above webpage links, so you'll have to cut and paste. Sorry about that!).

December Babble Class

On Sunday, December 18th, 2022, the Marin Amateur Radio Society had a Babble class. What's a babble class, you might be asking? It's a chance to get together and spend a morning and afternoon doing all things radio related. On the 18th, the

Babble Class project was to work on the club's communication van. Here's a photograph from the event:



DMR Workshop

With the advent of DMR or digital mobile radio within the ham radio world, a workshop was held at the Marin Amateur Radio Society's clubhouse on Tuesday, December 20th, 2022, at 10:00am. Participants were encouraged to bring their DMR radios and laptops and learn more about the use of these digital radios in emergency situations. More workshops are going to be scheduled. Here's a breakdown of the day's event and what was being discussed:

DMR workshop Tuesday 20 December 2022

Purpose:

1. Dusting off the radios we have or having Santa bring inexpensive ones
2. Evaluating what we can use them for on public service
3. Identifying what MARS might need to do to deploy in 2024
4. Being prepared to walk away if necessary

Where we stand in 2022

1. Mototrbo proprietary standard became public domain in 2005 as DMR ETSI TR/TS 102 open standard
2. Market is flooded with radios from Motorola, Hytera and Chinese manufacturers
3. None of the big 4 Japanese manufacturers have DMR radios because they want to flog their proprietary D-Star or System Fusion
4. DMR was designed for business, not ham radio
5. Overwhelming complexity is not for the faint hearted
6. Significant advantages obtain for public service, but only with careful planning and training
7. The days of "charge your batteries the night before" and "wing it on the day" don't cut it
8. Many hams will never make it away from FM to DMR, nor should they

Key DMR elements

1. Repeaters organized as clusters, eg Bay Area, Sierra Nevada
2. Internet connectivity to all repeaters

3. Gateways such a Brandmeister et al to facilitate connectivity, also to cross connect proprietary standards such as D-Star and Fusion.
4. Talk groups, static and dynamic, to address user needs San Francisco TG: 311040; Orinda (NorCal) TG: 31068 (How to set up a private talk group on Orinda by hitting disconnect?)
5. Universal user IDs to control access from RadioID.net
6. Standard code plugs that users can modify: San Francisco ARC “starter” code plugs: <https://www.sfarc.org/repeaters--nets.html> or buy (expensive!) from https://www.bridgecomsystems.com/search?type=article%2Cpage%2Cproduct&q=code*+plug*

Droidstar

<https://github.com/nostar/DroidStar>

This software connects to M17, Fusion (YSF/FCS, DN and VW modes are supported), DMR, P25, NXDN, D-STAR (REF/XRF/DCS) reflectors and AllStar nodes (as an IAX2 client) over UDP.

Useful references

<https://docs.google.com/document/d/1fEix5qQGkuolxfktV2uGYHuq69oXmZN3GfDzsgDTdPc/edit>

<https://www.n1clc.com/2019/06/dmr-tip-3-digital-monitor-modes.html>

<https://www.miklor.com/DMR/DMR-Tutorial.php>

https://www.repeaterbook.com/repeaters/feature_search.php?state_id=06&type=DMR

<https://m.youtube.com/watch?v=5FAft1QCtC0>

<https://hose.brandmeister.network>

Saturday morning net on Worldwide talk group 91 starts about 8AM

https://www.pistar.uk/dmr_bm_talkgroups.php - list of Brandmeister talk groups

Callum shared this simplex info:

They are:

433.50

441.00

446.075

446.50

CC1

TS1

TG99

DMR Repeaters accessible from Marin and Sonoma

Sutro tower, W6PW 444.225 MHz

Orinda, K6LNK 443.500 MHz

Diablo W6CX 145.000/147.500 MHz

Vallejo K6LI 145.310 MHz

English Hill W6SON 443.1 MHz

Santa Rosa K6ACS 442.1125

Bodega Bay KJ6QBM 440.325 MHz

Sonoma W6AJF 441.0125

This cohort of Santa's DMR elves have promised to mentor others:

Michael K6MLF

Larry KK6QPE

Dan N6HLZ

Brian K6RJR

Andy KF6SZF

Jim KM6WWY

James KI6RGP

Dan KN6PNA
Callum KN6KQR
Charlie AI6TT

Rob Rowlands NZ6J
415 849 5667

PROGRAMMING CABLES SOURCE: Jim S., KM6WWY
Ebay.com Seller: [bluemax49ers](#) KJ6ZWL, Campbell, CA
I have purchased 2 or 3 of his cables, they have been good quality and guaranteed to work.

New Monthly Columns for the QSA-5

We're going to start covering DMR in more detail, and on a regular basis. We'll also start covering QRP radio which is becoming extremely popular. We'll start with a very brief introduction to DMR radio. Added this month is an article on the mysterious world of code plugs. Please note that this is a very basic introduction to DMR, meant for radio operators new to this type of communication tool. With each passing article, the material will become more advanced. However, we wanted to make sure everyone was on a level playing field, so we started at the beginning.

DMR Radio

What is DMR or Digital Mobile Radio

Digital Mobile Radio (DMR) is a type of digital radio communication technology that is used for voice and data communication. It is used primarily in professional mobile radio (PMR) systems, such as those used by public safety organizations, businesses, and transportation companies.

DMR is a two-slot TDMA (Time Division Multiple Access) technology, which means that it can transmit two independent channels on a single frequency band. This allows for greater capacity and efficiency in communication systems, as more

users can be accommodated on a single frequency. DMR also uses error-correction techniques to improve the reliability and quality of the transmitted signals.

One of the key advantages of DMR is that it is interoperable with other digital radio systems, such as TETRA (Terrestrial Trunked Radio) and P25 (Project 25). This means that users of different digital radio systems can communicate with each other using DMR equipment.

In addition to voice communication, DMR also supports data transmission, including the transmission of text messages, GPS location information, and other data. This makes it a versatile technology that is suitable for a wide range of applications, including public safety, transportation, utilities, and other industries.

How does Digital Mobile Radio work

DMR uses Time Division Multiple Access (TDMA) technology to divide a frequency channel into two time slots, allowing two users to communicate over the same frequency channel simultaneously. This allows DMR systems to increase the capacity of a single frequency channel, as well as to improve the efficiency and clarity of voice communication.

In a DMR system, each user is assigned a unique identifier called a "radio ID," which is used to identify the user on the network. When a user wants to initiate a call, they send a request to the network, which then assigns them one of the available time slots on the frequency channel. The user's radio then transmits their voice data during their assigned time slot, and the receiving radio listens for and receives the transmission during its assigned time slot.

DMR systems use error correction and encryption to improve the reliability and security of voice communication. They also support a range of features, such as group calling, individual calling, and text messaging, as well as GPS tracking and location services.

Overall, DMR is a highly efficient and reliable technology that is widely used in professional mobile radio systems for voice communication.

How can Digital Mobile Radio Be Used in an Emergency

Digital Mobile Radio (DMR) can be used in emergency situations to provide reliable and efficient communication between first responders and other emergency personnel. In an emergency, the ability to quickly and accurately communicate is critical, and DMR can help to facilitate this communication by providing a secure and reliable means of communication.

One of the key advantages of DMR in emergency situations is its ability to transmit voice and data simultaneously. This allows emergency responders to not only communicate with each other, but also to transmit important information such as location data, incident details, and other relevant information.

DMR also offers a number of features that are specifically designed for use in emergency situations. For example, DMR supports group calling, which allows multiple users to be part of a single call, making it easier for emergency responders to coordinate their efforts. DMR also supports emergency calling, which allows users to send an emergency alert to all other users on the system, alerting them to the need for assistance.

Overall, DMR is a reliable and effective technology for emergency communication, and is widely used by public safety organizations, as well as other emergency responders, around the world.

Code Plug Terminology

The most difficult part of the transition from analog to DMR radios is the code plug. A Code Plug is nothing more than a fancy name for the software file that gets loaded into your radio to tell it what to do. Thanks to Miklor for the following information.

There are two stages to programming a DMR radio. The first stage is very similar to an analog radio. It determines the transmit and receive frequency of your repeater. The second part directs you through the network. Here are some terms you need to be familiar with:

TDMA / Time Slots

TDMA stands for Time Division Multiple Access.

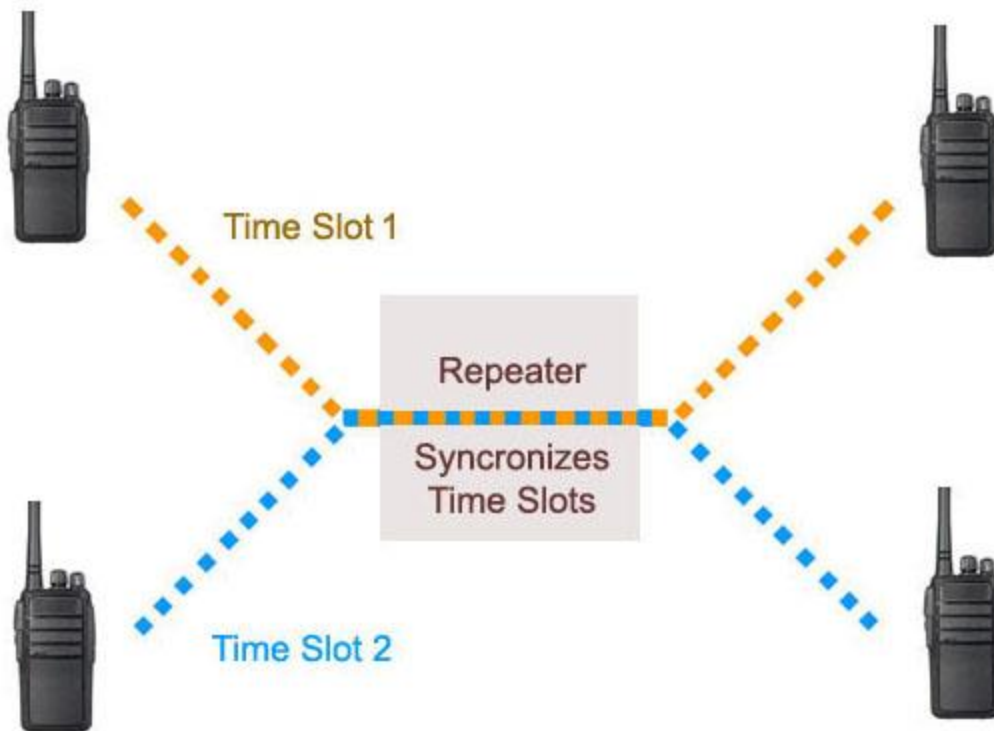
A standard FM handheld transmits a single carrier from the time you press the PTT to the time you release it. With the digital magic of TDMA, your signal is divided into alternating 30ms segments. This allows two signals to interweave, so two different conversations can take place on the same frequency at the same time.

The graphic below illustrates the splitting of a transmitted digital signal into these 30ms time slices. These are called Time Slots.

The code plug's Time Slot (TS) parameter determines which path you will be using, TS1 or TS2.



The code plug's Time Slot (TS) parameter determines which path you will be using, TS1 or TS2.



Color Code

The digital Color Code (CC) has nothing to do with a color. Compare it to a CTCSS or DCS code. Its function is to prevent interference between two repeaters with overlapping coverage. The proper CC is required for access and is assigned by the repeater's owner. (normally, but not always CC1)

Talk Groups (TG) / Digital Contacts

There are well over a thousand different Talk Groups worldwide, each with its own assigned network ID. These TGs fall into various categories, such as States, Regions, Countries, Languages, etc. as well as general chat channels.

When you determine which TG's you want to use, you would then add them to your Digital Contact list.

Channels

This is what ties everything for a specific channel together. Channel information contains information such as frequency, power, time out, TG, CC, etc. A further example is found below.

Zones

A Zone is the area in your radio where you group together related Channels. You can set up the zones in groups such as:

- *Your local repeater's channels*
- *Simplex channels*
- *Most commonly used channels, etc.*

Admit Criteria

This determines when you are allowed to transmit. The options are:

Color Code (preferred) - Allows you to transmit only when the time slot is available.

Channel Free - Allows you to transmit when the channel is clear, however there may be someone using the same time slot.

Always - This allows you to transmit even if there is another QSO on a different time slot. This would interrupt the current QSO. The only time 'Always' should be used is if on a simplex channel or in the analog mode.

Setting up a Code Plug

Although code plugs are not interchangeable between models, the basics are the same.

Step 1 – Transmit Talk Groups

The first step is to identify the Talk Groups desired by Name and Group ID.

The TG fields may be labeled differently, depending on your radio's software, but they all serve the same purpose.

For example: Tx Contacts / Digital Contacts / Talk Groups are all the same.

* When entering the TG ID, you are required to enter either 'Group Call' or 'Private'. Always enter 'Group Call' for all Talk Groups.

** You will also notice below that some software will sort the name column alphabetically. If it does, preceding the contact name with a period or comma will help categorize items by group names.

Contacts / Talkgroups				
No.	Name	Attr	Call Type	Call ID
1	...Local 2	Digital	Group Call	2
2	...Local 9	Digital	Group Call	9
3	...TAC 310	Digital	Group Call	310
4	...TAC 311	Digital	Group Call	311
5	...TAC 312	Digital	Group Call	312
6	..DC	Digital	Group Call	3111
7	..DE	Digital	Group Call	3110
8	..MD	Digital	Group Call	3124
9	..NJ	Digital	Group Call	3134
10	..NY	Digital	Group Call	3136
11	..PA	Digital	Group Call	3142
12	..TX	Digital	Group Call	3148
13	..VA	Digital	Group Call	3151
14	.MidAtlantic	Digital	Group Call	3173
15	.Mountain	Digital	Group Call	3177
16	.Nationwide	Digital	Group Call	3100

ADD Delete Delete All Import Export

To start, I would suggest the following TGs:

TG 9 (repeater)

Connects to your local repeater only.

Does not apply to a hotspot

TG 2 (repeater)

Connects to your local repeater and those repeaters connected to the local network cluster. This could be upwards to a dozen or more repeaters across your state or region.

Again, does not apply to a hotspot.

Statewide Groups

Your state, and surrounding states. You do not need to be located in the state to use a state group, but it must be available in your repeater's active TG list. It

serves as a meeting place for those in your general area.

Nationwide 3100

This is a National Talk Group, sometimes referred to as a calling channel. Please use with courtesy. This TG links all repeaters nationwide. Although it is not a requirement for use, consider moving to a TAC channel for long conversations.

TAC channels

Secondary channels for long conversations or group chats. Common TAC channels are TG **311, 312...**

A sample of these and other TG's as can be found at:

[BrandMeister](#) and [DMR-MARC](#).

Parrot / Echo test - TG 9998, TS 2

This is a network echo test that allows you transmit up to 90 seconds, and after a 5 second pause, will repeat back to you exactly what the network users hear on their end. Excellent for audio level and distortion testing.

Note: On the Brandmeister network, the echo test is TG **9990, TS 2**

Step 2 - Channel Information

This is where the control information is entered. The data required here is the Frequency, Power, Color Code, TG, and Time Slot where the desired TG can be found. The main items required are shown below.

* Pay special attention to the Time Slot. If the wrong time slot is selected, you are going nowhere. This can easily be overlooked.

Channels Information

Digital/Analog Data

Channel Mode: **Digital** ←

Channel Name: **Bridge** ←

Band Width: **12.5kHz** ←

Scan List: **None** ←

Squelch: **Normal** ←

RX Ref Frequency: **Low** ←

TX Ref Frequency: **Low** ←

TOT[s]: **120** ←

TOT Rekey Delay[s]: **0** ←

Power: **High** ←

RX Frequency(MHz): **146.44500** ←

TX Frequency(MHz): **147.44500** ←

Admit Criteria: **Always** ←

Auto Scan ☐

Rx Only ☐

Lone Worker ☐

VOX ☐

Allow Talkaround ☐

Digital Data

Private Call Confirmed ☐

Emergency Alarm Ack ☐

Data Call Confirmed ☐

Compressed UDP Data Header ☐

Emergency System: **None** ←

Contact Name: **Bridge 3100** ←

Group List: **None** ←

Color Code: **1** ←

Repeater Slot: **2** ←

Privacy: **None** ←

Privacy No.: **1** ←

Analog Data

CTCSS/DCS Dec: **None** ←

CTCSS/DCS Enc: **None** ←

QT Reverse: **180** ←

Rx Signaling System: **Off** ←

Tx Signaling System: **Off** ←

☒ Reverse Burst/Turn-off Code

☐ Display PTT ID

Decode 1 ☐

Decode 2 ☐

Decode 3 ☐

Decode 4 ☐

Decode 5 ☐

Decode 6 ☐

Decode 7 ☐

Decode 8 ☐

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- Channel Mode = Digital
- Band Width = 12.5 kHz
- Scan List = (save this option for later)
- Time Out Timer = 120 is a good starting point
- Power = Least amount needed to get into repeater
- Channel Name = Name that appears in your channel list
- Tx and Rx Frequency = Operating Frequency
- Admit Criteria = Color Code (repeater) or Always (simplex)
- Contact Name = This is the TG name
- Color Code = Determined by the repeater owner
- Repeater Slot = Determined by the repeater owner

Step 3 - Zone

After your Channels have been set up, you will need to place them into areas called Zones. The channels in a Zone can be arranged in any order. The same channel can appear in multiple zones.

So there you have it. Hopefully this has made you feel a little bit more comfortable about creating a code plug. A good recommendation would be to acquire a sample CP for your radio, examine it, and build upon it.

Next month, we'll look at Wi-Fi hotspots and how to set them up. I'd like to thank the folks of Miklor for the bulk of the information presented in this article.

QRP Radio

While many ham radio operators dream of having a huge ham shack, full of equipment, there's a growing group of hams that like take their radios with them as they travel around the country and the world. This is where QRP radio comes into the picture. This is a brief introduction to QRP radios meant for those hams new to the subject. As with the above article DMR radio, the subject matter will become more advanced with each passing issue of the QSA-5.

QRP is a term used in amateur radio to refer to low-power communication, typically using transmitters with output power of 5 watts or less. QRP operations are popular among amateur radio operators because they can be accomplished with relatively simple and inexpensive equipment, and because low power consumption allows for portable and handheld operation.

There are many different ways that amateur radio operators can participate in QRP operations. Some operators build and operate their own QRP transmitters and receivers, using kits or plans available from various manufacturers. Others use commercially available QRP transceivers, which combine both transmit and receive capabilities in a single unit.

Amateur radio operators who participate in QRP operations often enjoy the challenge of making contacts using a minimal amount of power, and often use portable or mobile setups to operate from a variety of locations. QRP operations are also popular among amateur radio operators who are interested in emergency communication, as low-power setups can be used to communicate when other forms of communication are not available.

What are the advantages of QRP radio?

QRP radios are radios that are designed to operate with a low power output, typically 5 watts or less. QRP stands for "low power" or "reduced power" in amateur radio terminology.

There are several advantages to using QRP radios:

1. **Cost:** QRP radios are typically less expensive than high-power radios, making them an affordable option for hams on a budget.
2. **Portability:** QRP radios are often smaller and lighter than high-power radios, making them easier to carry and use in a variety of locations.
3. **Battery Life:** QRP radios generally require less power to operate, which means they can run longer on a single charge or set of batteries. This can be especially useful in emergency situations or when operating portable.
4. **Efficient use of the radio spectrum:** By using less power, QRP radios generate smaller signals that are less likely to interfere with other users of the radio spectrum. This can be important in crowded frequency bands where high-power signals can cause interference.
5. **Challenge and skill-building:** Some hams enjoy the challenge of using low-power radios to make long-distance contacts or to operate in difficult conditions. Using a QRP radio requires the operator to have a good understanding of propagation, antenna design, and operating techniques, which can be a rewarding and educational experience.

What is the best antenna for QRP radios

The best antenna for a QRP radio will depend on a variety of factors, including the

type of radio, the frequency or band being used, the location where the antenna will be used, and the goals of the operator. In upcoming articles we'll look at some specific antennas that are easy to build and will cover more generalized needs. Some general considerations for selecting an antenna for a QRP radio include:

1. Frequency and band: Different antennas are designed for specific frequency ranges and bands. Make sure to select an antenna that is suitable for the frequency and band you plan to operate on.
2. Antenna type: There are many different types of antennas, including dipoles, verticals, yagis, and more. Each type of antenna has its own characteristics and advantages, and the best choice will depend on your specific needs and goals.
3. Antenna length: The length of an antenna can affect its performance. In general, shorter antennas are better suited for QRP operation because they are easier to transport and require less space. However, longer antennas can often provide better performance in certain situations.
4. Antenna location: The location of the antenna can have a significant impact on its performance. In general, an antenna that is higher off the ground and away from objects will perform better than one that is closer to the ground or surrounded by objects.
5. Antenna gain: Antennas with higher gain can focus their signal in a specific direction, which can be useful for making long-distance contacts. However, high-gain antennas may also be more directional, which can make it more difficult to hear signals coming from other directions.
6. It may be helpful to consult with other hams or research online to find out which antennas are popular and perform well for QRP operation. It may also be a good idea to experiment with different antennas to see which one works best for your specific situation.

Modern QRP Radios are based on SDR or Software Defined Radio

Software defined radio (SDR) is a type of radio communication system in which the functions of a traditional radio receiver or transmitter are implemented using software running on a computer or embedded processor. SDR systems are characterized by their ability to be reconfigured or "defined" by software, allowing

them to support a wide range of communication standards and protocols. In a traditional radio system, the various functions of the radio, such as demodulation, frequency synthesis, and filtering, are implemented using dedicated hardware components. In an SDR system, these functions are implemented using software running on a general-purpose processor or computer. This allows SDR systems to be more flexible and adaptable than traditional radio systems, as the software can be easily modified or updated to support new standards and protocols.

SDR systems have a wide range of applications, including wireless communication, radio astronomy, and radio frequency identification (RFID). They are also used in a variety of settings, including military, commercial, and amateur radio. SDR technology has the potential to revolutionize the field of radio communication by enabling the development of more flexible, adaptable, and cost-effective radio systems.

Coming Next Month: The USDX HF Revolution

Ham Radio News

Each month, QSA-5 searches the internet for stories about amateur radio in the news. As editor of our publication, I merely present these articles and do not take a position regarding their message or content. The news was a bit slow during the holidays. Our first story regards Winter Field Day 2023:

Winter Field Day 2023: While the dates have passed, it's a good read for those of you wishing to participate in next year's event.

<https://www.arrl.org/news/winter-field-day-2023>

Marines To Gain Radio Op Experience Via Amateur Radio: A good article from the ARRL.

<https://www.arrl.org/news/marines-to-gain-radio-op-experience-via-amateur-radio>

Ham radio operators: A long-lasting technology: An interesting piece about the longevity of radio.

<https://www.winknews.com/2022/06/24/ham-radio-operators-a-long-lasting-technology/>

Amateur Radio Club Members Assist Law Enforcement: A local radio club provided surveillance for a large state fair.

<http://www.arrl.org/news/amateur-radio-club-members-assist-law-enforcement>

If China declares war, these ham radio enthusiasts could be crucial: An interesting piece from the Los Angeles Times:

<https://www.latimes.com/world-nation/story/2022-10-27/taiwan-ham-radio-amateurs-civil-defense>

Amateur Radio Operators Continue Response to Hurricane Ian: One of the most important aspects of amateur radio is assisting when disaster strikes. Here's a piece from the ARRL about the role amateur radio has played during this devastating event.

<http://www.arrl.org/news/amateur-radio-operators-continue-response-to-ian>

Local ham radio operators providing help as Hurricane Ian sweeps across Florida: This comes from TV Station WTVA (TUPELO, Mississippi). This piece covers how amateur radio operators connect family members with loved ones in the path of the hurricane.

https://www.wtva.com/news/local-ham-radio-operators-providing-help-as-hurricane-ian-sweeps-across-florida/article_f2fda4e8-3f6c-11ed-bd5f-97a1bad70dad.html

FCC Regulatory News

Here are the current regulatory changes and FCC news as it applies to Amateur Radio. This section of the QSA-5 newsletter was introduced last year. We will add new regulations and rules monthly, removing the older regulations and rules as new regulations/rules are introduced. As of the August 2021 issue of the QSA-5 newsletter, this list of FCC regulations and changes will be reduced, only covering this year's new regulations and rules. The newest regulations and changes will appear at the top of the list. Note that we are not able to cover every change the FCC has made this year within our publication. Also note, due to the holidays it was a slow month regarding FCC news:

FCC Grants an ARRL Emergency Request to Permit Higher Data Rate Transmissions for Hurricane Relief Communications: The FCC has granted a 60-day ARRL emergency request intended to facilitate amateur radio emergency communications for hurricane relief.

<http://www.arrl.org/news/fcc-grants-an-arrrl-emergency-request-to-permit-higher-data-rate-transmissions-for-hurricane-relief-c>

FCC Grants an ARRL Emergency Request to Permit Higher Data Rate Transmissions for Hurricane Relief Communications: The FCC has granted an [ARRL](#) emergency request for a 60-day temporary waiver intended to facilitate amateur radio

emergency communications for hurricane relief.

[https://www.arrrl.org/news/fcc-grants-an-arrrl-emergency-request-to-permit-higher-data-rate-transmissions-for-hurricane-relief-c](https://www.arrl.org/news/fcc-grants-an-arrrl-emergency-request-to-permit-higher-data-rate-transmissions-for-hurricane-relief-c)

FCC Hiring for High Frequency Direction Finding Center: Just in case you're looking for a career change:

<http://www.arrrl.org/news/fcc-hiring-for-high-frequency-direction-finding-center>

FCC Legacy CORES System to be Retired: It seems that the FCC is retiring their CORES system:

<https://www.arrrl.org/news/fcc-legacy-cores-system-to-be-retired>

FCC Proposes Record \$34,000 Fine for Alleged Interference and Unauthorized Transmissions During Idaho Wildfire: The FCC takes using unauthorized frequencies very seriously.

<http://www.arrrl.org/news/fcc-proposes-record-34-000-fine-for-alleged-interference-and-unauthorized-transmissions-during-idaho>

Propagation News

Here are some links dedicated to propagation conditions, space weather, sunspot cycle information and all things related to solar conditions:

The K7RA Solar Update: This is the K7RA solar update, which is updated regularly:

<https://www.arrrl.org/news/the-k7ra-solar-update-762>

DX.QSI Propagation:

A simple, straightforward website for propagation conditions that is regularly updated:

<https://dx.qsl.net/propagation/>

Radio Society of Great Britain: What's New and Propagation Now:

A great resource from the UK version of the ARRL regarding solar activity and propagation:

<https://rsgb.org/main/technical/propagation/whats-new-propagation-now/>

SunSpotWatch.com:

A good general interest site for amateur radio operators who follow solar activity:

<http://sunspotwatch.com/>



DIY Radio References

We have added a few additional links to our list and will continue to do so as we discover more websites related to the Do-It-Yourself movement! QSA-5 is going to keep adding to the original list of online resources, bringing you more resources as we find them. If there is anything you think would be useful to other club members, contact me and I will be happy to include it in this reference section.

Microcontrollers and Single Board Computers: With the advent of the Arduino micro-controller board, the Raspberry Pi (a single board minicomputer) and Texas Instrument's Launchpad (also a single board microcontroller), Amateur Radio enthusiasts can build both accessories, such as antenna tuners, and fully functioning transceivers. I have spent the last year at the University of California studying these devices, learning how to use them and incorporate them into electronic projects. I was able to build two HF receivers based on the Arduino and Raspberry Pi devices. The best news of all is that these devices are inexpensive! I encourage you to check these websites out!

Arduino: The Arduino microcontroller board was the first to popularize these devices. They are inexpensive and can be used for a variety of radio related projects. I will include some links to radio related Arduino projects in the next issue of the QSA-5. Here's a link to the Arduino homepage:

<https://www.arduino.cc/>

Raspberry Pi: Did you every wish you could have a PC small enough to fit into your shirt pocket? Your dream has come true. The Raspberry Pi 4 is a fully functional Quadcore 1.6 GHz computer, about the size of a package of playing cards. It has an Ethernet jack, two USB 2 ports, two USB 3 ports and two HDMI ports. Next month, I'll post some links to radio related Raspberry Pi projects. Here's a link to their homepage.

<https://www.raspberrypi.org/>

Texas Instruments TI Launchpad: The Launchpad is Texas Instruments answer to

the Arduino. The Launchpad is geared more towards advanced projects and is slightly more expensive. However, the Arduino still holds its own against this device. The Arduino also has more in the way of open-source software. Here is a link to the TI Launchpad homepage.

<https://www.ti.com/design-resources/embedded-development/hardware-kits-boards.html>

Tools for electronics: It is a lot easier to build or repair your electronics if you have the right tool. Paperclips and duct tape are not the solution to everything (unless you are McGyver – hopefully, you got the reference). Therefore, we added some links to suppliers of electronics tools.

All Electronics: A one-stop electronics shop that has a variety of tools for your repair and building needs:

<https://www.allelectronics.com/category/780/tools-and-supplies/1.html>

Jameco Electronics: A supplier of decent tools at a reasonable price:

<https://www.jameco.com/Jameco/content/tools.html>

Electronic Printed Circuit Boards (PCB): If you design and build projects that require specific circuit boards, you know how difficult it is to find a board that will work for your purposes. Designing a board and then having it made can be expensive. Here is a company that has a large number of radio PCBs you can purchase and then add components to. They also can take your design and fabricate a PCB at a very reasonable cost. The company's name is **PCBway**:

<https://www.pcbway.com/project/>

Electronic Components and Parts: Many of us involved in amateur radio are constantly tinkering with electronics. It seems to be part of our genetic makeup! Here are some links to companies that sell electronic components and parts, starting with San Rafael's own Electronics Plus (Support local business).

Electronics Plus: It's great to have an electronics store close by for those times when you need a part immediately:

<https://www.electronicplus.com/>

Digikey: A good source for DIY and Maker projects as well as parts. They claim to have the world's largest selection of electronic components.

<https://www.digikey.com/>

Jameco: This company is a good source for almost everything, especially mainstay items such as resistors, capacitors, etc.

<https://www.jameco.com/>

Homemade Antennas: Many new amateur radio enthusiasts put a great deal of time and effort into researching their first radio. However, they often neglect the most important component to a successful radio experience, the antenna. Even if you have some ham radio experience, antennas can be a daunting subject. Commercially manufactured antennas can be expensive and beyond your budget during these hard financial times. Even if you have the funds available to purchase an antenna, reading through the antenna's specs can be akin to reading some long lost ancient language. A good solution for increasing your knowledge of antennas and radio wave propagation, not to mention cutting the costs down, is to build them yourself. Here are some links to DIY (do it yourself) sites to give you a start:

Antenna building basics:

<https://www.wikihow.com/Build-Several-Easy-Antennas-for-Amateur-Radio>

Good Reference for several antenna types:

<https://www.hamradiosecrets.com/homemade-ham-radio-antennas.html>

A step-by-step guide for building a simple antenna:

<https://geardiary.com/2012/07/21/building-a-simple-ham-radio-antenna-without-soldering/>

Instructions for a VHF/UHF dual band antenna:

<https://www.instructables.com/Quarter-Wave-Dual-Band-VHFUHF-Ham-Radio-Antenna/>

Build an HF dipole antenna:

<https://www.electronics-notes.com/articles/antennas-propagation/dipole-antenna/hf-ham-band-dipole-construction-80-40-20-15-10-meters.php>

Introduction to antennas:

<https://www.onallbands.com/ham-radio-antenna-options-for-home-and-portable-operations/>

Ham Radio QRP Transceiver Kits: With the advent of SDR (Software Defined Radio), building fully functioning ham radios has become a lot easier and extremely inexpensive. While, having fewer bells and whistles, as well as being low power units, many have fully functional touchscreens and cover many of the HF bands:

An easy to build QRP transceiver. No soldering needed to build:

<https://www.hfsignals.com/>

An easy to build, single band CW kit:

<https://grp-labs.com/>

Offering several kits and finished transceivers:

<https://youkits.com/>

Propagation Websites: Propagation is a key factor in successful radio communications. Here are some links to websites that will help you with all your basic propagation needs:

Real time band conditions:

<https://qrznow.com/real-time-band-conditions/>

VOACAP band conditions:

<https://www.voacap.com/hf/>

ARRL Propagation Page:

<http://www.arrl.org/propagation>

Real Time HF Propagation Prediction:

<https://hamwaves.com/propagation/en/index.html>

Ham Radio Websites of general interest:

Ham Radio News: Here are some sites and articles you may find of interest regarding ham radio.

ARRL News Page, which is a good place to find national news regarding ham radio:

<http://www.arrl.org/news>

QRZ Now. Another good site for ham radio news from around the globe:

<https://qrznow.com/>

The Amateur Radio Newsline. An AP styled news feel page for amateur radio:

<https://www.arnewsline.org/>